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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
ROSARIO-VASQUEZ, DENNIS	
ART UNIT	**PAPER NUMBER**
2621	

DATE MAILED: 09/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/880,207	BRULS ET AL.	
	Examiner	Art Unit	
	Dennis Rosario-Vasquez	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *Amend. 06.21.04*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *June 21, 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment was received on June 21, 2004 and has been entered and made of record. Currently, claims 1-16 are pending.

Response to Arguments

2. Applicant's arguments filed in amendment on June 21, 2004 have been fully considered but they are not persuasive.

3. Regarding page 10, lines 6-9 the amendment states," De Jonge fails to disclose "determining statistics in at least one image" or "weights under the control of the statistics" as is recited in claim 1."

However, De Jonge et al. does disclose determining statistics in at least one image (maximum and minimum values are determined between two images in col. 6, lines 49-52 and 64-67.).

4. Applicant's arguments, see amendment, pages 10-12, filed June 21, 2004, with respect to the rejection(s)of claim 4 under De Jonge et al. (US Patent 5,467,380 A) and Kessen et al. (US Patent 5,055,927 A) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of De Jonge et al. and Auyeung et al. (US Patent 5,486,863 A).

Drawings

5. The subject matter of this application admits of illustration by a drawing to facilitate understanding of the invention. Applicant is required to furnish a drawing under 37 CFR 1.81. No new matter may be introduced in the required drawing.

The amendment filed on June 25, 2004 indicated amended drawings for figures 1,3,4 and 6; however, only the original figures 1,3,4, and 6 are provided with the amendment. Please resubmit the amended figure 1,3,4 and 6.

Specification

6. Due to the amendment filed on June 25, 2004, the objections to the amendment was withdrawn.

Claim Objections

7. Due to the amendment filed on June 25, 2004, the objections to claim 2 was withdrawn.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1,2,3,5,6,7,8,9,10,11,12,13 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by De Jonge et al. (US Patent 5,467,380 A).

Regarding claim 1, De Jonge et al. discloses a method of noise filtering an image sequence (V1), comprising the steps of:

a) computing means (Fig. 1, num. 51) for determining (11) statistics (Fig. 1, num. 51 determines a maximum and minimum values as mentioned in col. 6, lines 45-52. Note that De Jonge et al. additionally discloses that the maximum and minimum values can be replaced with "other statistical parameters" as mentioned in col. 6, lines 64-67.) in at least one image (Fig. 1, num. 10) of the image sequence (V1) (Fig. 1, num. 7 is a video camera that produces a sequence of images as mentioned in col. 4, lines 35-37.); and

b) filtering means (fig. 1, numerals 40-45) for calculating (14) (fig. 1, numerals 40-45 contains multipliers 43,44 and an adder 45) at least one filtered pixel value (P_t') (The output of fig. 1, num. 45 is an output of a spatial filter which is made from numerals 40-45 as mentioned in col. 5, lines 41-43 and 48-50.) from a set of original pixel values (P_t,M_i) (Fig. 1 , numerals 10-13) obtained from the at least one image (Fig. 1, num. 10), wherein the original pixel values (P_t,M_i) (Fig. 1 , numerals 10-13,I_n) are weighted (13) (Fig. 1, numerals 23-26,43 and 44 weight the images I_n as mentioned in col. 4, lines 64-66 and are weighted in a later stage at 43 and 44.) under control (12, α) (Fig. 1, num. 50 is a comparator for thresholding that receives the maximum and minimum statistical values as shown by the arrow between numerals 51 and 50 of fig. 1. Note that the output of the comparator 51 permits a respective weight to be outputted from numerals 18-21 based on the threshold as mentioned in col. 4, lines 52-61.) of the statistics (11) (fig. 1, num. 51).

Regarding claim 2, De Jonge et al. discloses the method as claimed in claim 1, wherein the step of calculating comprises:

a) weighting (13) (Fig. 1, numerals 23-26,43 and 44 weight the images I_n as mentioned in col. 4, lines 64-66 and are weighted in a later stage at 43 and 44.) the set of original pixel values (P_t,M_i) (Fig. 1 , numerals 10-13) under control (12, α) (Fig. 1, num. 50) of the statistics (11) (fig. 1, num. 51) to obtain a weighted set of pixel values (P_t,N_i) (Fig. 1, numerals 22 outputs a weighted set as mentioned in col. 5, lines 3-6.); and

b) furnishing the weighted set of pixel values (P_t,N_i) (fig. 1, numeral 22 outputs a weighted set as mentioned in col. 5, lines 3-6.) to a static filter (fig. 1, numerals 40-45 is a spatial filter as mentioned in col.5 , lines 41-43 receives the weighted sum 22 at numeral 42 via numeral 27.), in which the at least one filtered pixel value (P_t') (The output of fig. 1, num. 45 is an output of a spatial filter which is made from numerals 40-45 as mentioned in col. 5, lines 41-43 and 48-50.) is calculated from the weighted set of pixel values (P_t,N_i) (Fig. 1, numeral 22 outputs a weighted set as mentioned in col. 5, lines 3-6.) (The at least one filtered pixel value 45 is calculated based on the previous calculated weighted set 22).

Regarding claim 3, De Jonge et al. discloses a method as claimed in claim 1, wherein the statistics (11) (Fig. 1, num. 51 determines a maximum and minimum values as mentioned in col. 6, lines 45-52. Note that De Jonge et al. additionally discloses that the maximum and minimum values can be replaced with "other statistical parameters" as mentioned in col. 6, lines 64-67.) include a spatial and/ or temporal spread (S) (Fig. 1, num. 51 determines "differences between pixel-values of corresponding pixels of successive images [in time]" as mentioned in col. 6, lines 45-52.) of the set of original pixel values (P_t,M_i) (Fig. 1 , numerals 10-13 are used to determine "differences between pixel-values of corresponding pixels of successive images [or between the images of fig. 1, numerals 10-13] (col. 6, lines 45-51).")

Regarding claim 5, De Jonge et al. discloses a method as claimed in claim 1, wherein the set of original pixel values (P_t,M_i) (Fig. 1 , numerals 10-13) include a central pixel value (P_t) ("32 X 32 pixels" is a central region of 32 X 32 central pixels from each set of the original pixel values.) and spatially and/or temporally surrounding pixel values (M,) (Each set of original pixel values has a position and time relationship as mentioned in col. 4, lines 34-37.), wherein as a result of the noise filtering (Fig. 1 is a circuit for noise filtering as mentioned in col. 4, lines 22-24.), the central pixel value (P_t) is replaced (The pixels within the central 32 X 32 region are weighted. As a result of weighting each central pixel value is changed based on the differences of pixels values within the successive images using a LUT.).

Regarding claim 6, De Jonge et al. discloses the method as claimed in claim 2, wherein the set of weighted pixel values (P_t,N_i) (Fig. 1, numeral 22 outputs a weighted set as mentioned in col. 5, lines 3-6.) is obtained (Fig. 1, num. 22 generates a weighted set.) by taking (The "successive images", I_1 I_2 I_3 I_4 I_5 or I_n of fig. 1, numerals 10-13 each has a central region of interest as mentioned in col. 4, lines 34 37 and col. 6, lines 45-51.) for each pixel in the set of original pixels (P_t,M_i) (Fig. 1 , numerals 10-13), a combination (One 32 X 32 portion for one image I_1 and another 32 X 32 portion for another image I_2.) of a portion α (32 X 32 portion for one image I_1) of the original pixel value (P_t,M_i) (Fig. 1 , numerals 10-13, I_n) and a portion 1-α (32 X 32 portion for another image I_2 in col. 6, lines 47,48) of a central pixel value (P_t) ("32 X 32 pixels" is a central region of interest from each set of the original pixel values I_n.).

Regarding claim 7, De Jonge et al. discloses a method as claimed in claim 1, wherein the statistics (11) (Fig. 1, num. 51 determines a maximum and minimum values as mentioned in col. 6, lines 45-52. Note that De Jonge et al. additionally discloses that the maximum and minimum values can be replaced with "other statistical parameters" as mentioned in col. 6, lines 64-67.) are furnished (via numeral 50:statistical comparator) to a look-up table (12) (fig. 1, num. 18-21:LUT), from which look-up table (12) (The outputs of fig. 1, numerals 18-21:"LUT") a control signal (a) is obtained ("b" is a control signal outputted based on numerals 28 and 40.), which control signal (a) ("b" outputted from 40) controls the weighting (13) (in a later stage at 43 and 44).

Regarding claim 8, De Jonge et al. discloses a method as claimed in claim 2, wherein the at least one filtered pixel value (P_t') (The output of fig. 1, num. 45 is an output of a spatial filter which is made from numerals 40-45 as mentioned in col. 5, lines 41-43 and 48-50.) is obtained by calculating (14) (fig. 1, numerals 40-45 contains multipliers 43,44 and an adder 45) a median (De Jonge et al. states,"Spatial filtering can be carded out in the form of spatial averaging...weighted median filtering (col. 3, lines 12-14).") of the weighted set of pixel values (P_t,N_i) (Fig. 1, numerals 22 outputs a weighted set as mentioned in col. 5, lines 3-6.)

Claim 9 was addressed in claim 8.

Regarding claim 10, De Jonge et al. discloses a method as claimed in claim 9, the method comprising:

a) determining (41) a spatial spread (S_{spat}) (Fig. 1, num. 14-17) calculated from spatially displaced original pixel values (P_t,M_i) (Fig. 1 , numerals 10-13, I_n have a "position" and "time sequence" in col. 4, lines 34-36.) in the set of original pixel values (P_t, M_i, P_{t1}, P_{t2}) (fig. 1 ,num. 10-13);

De Jonge et al. states," spatial filtering...is performed in dependence on the weight factors being determined by the motion detection means (col. 5, lines 17-20).") Note that "Motion detection means are provided comprising subtractors (col. 4, lines 42-44).”; and “spread” according to the specification includes a difference “for computing a displacement or differences of pixel-values pertaining to pairs of successive images (col. 4, lines 42-44).”;

b) determining (42) a temporal spread (S_{temp}) (Fig. 1, num. 14-17) calculated from temporally displaced original pixel values (P_t, P_{t1}, P_{t2}) (Fig. 1 , numerals 10-13, I_n have a "position" and "time sequence" in col. 4, lines 34-36.) in the set of original pixel values (P_t, M_i, P_{t1}, P_{t2}) (fig. 1 ,num. 10-13);

(De Jonge et al. states, "First a temporal averaging is performed involving weight factors depending on the presence of motion in the image...") Note that "Motion detection means are provided comprising subtractors for computing differences of pixel-values pertaining to pairs of successive images (col. 4, lines 42-44).") Therefore motion detection means are used for both the spatial and temporal spread.; and

c) weighting (46) (Fig. 1, num. 43 and 44 outputs a weighted signal.) the spatially displaced original pixel values (P_t,M_i) (Fig. 1 , numerals 10-13, I_n are multiplied in num.44) under control (43) (Fig. 1, num. 40:LUT generates a weight "b" for multiplying in 44.) of the spatial spread (S_{spat}) (Fig. 1, num. 14-17) and the temporally displaced original pixel values (P_t, P_{t1}, P_{t2}) (Fig. 1 , numerals 10-13, I_n have a "position" and "time sequence" in col. 4, lines 34-36 and multiplied in num. 43.) under control (44,45) (fig. 1, num. 41 generates a weight for multiplying in 43.) of the temporal spread (S_{temp}) (Fig. 1, num. 14-17).

Regarding claim 11, De Jonge et al. discloses a method as claimed in claim 10, wherein the weighted temporally displaced original pixel values (WP1,WP2) (The output of fig. 1, num 43) are divided (a) (The original images of fig. 1, num. 10-13 are initially divided into 32 X 32 regions in col. 6, lines 45-49.) to lessen their weight (The 32 X 32 region is preferred instead of a larger region as mentioned in col. 6, lines 52-56. Note that each region has a weight applied at a later process.) in the filtering (47) (The output of fig. 1, num. 45 is an output of a spatial filter which is made from numerals 40-45 as mentioned in col. 5, lines 41-43 and 48-50.).

Claim 12 has been addressed in claim 5. The wording of claim 12 is different from claim 5, but both claims are claiming the same limitation.

Regarding claim 13, De Jonge et al. discloses a method as claimed in claim 12, wherein filtered temporally displaced pixel values are used rather than temporally displaced original pixel values. During temporal averaging, differences between pixels are compared to a threshold. If the differences exceed a threshold, then the pixels values that exceeded the threshold are weighted for filtering at col. 4, lines 53-66.

Claim 15 has been addressed in claim 1.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over De jonge et al. (US Patent 5,467,380 A) in view of Auyeung et al. (US Patent 5,486,863 A).

Regarding claim 4, De Jonge et al. disclsoes the method as claimed in claim 3, wherein the spatial and/ or temporal spread (S) (Fig. 1, num. 51"comprises means for determining ...differences [fig. 1, numerals 14-17] between pixel-values of corresponding pixels of successive images [in time]" as mentioned in col. 6, lines 45-52.) is a sum (Fig. 1, num. 28 is an adder that adds results based on the spread or differences.) of absolute differences (Fig. 1, num. 14-17 have "magnitudes" as mentioned in col. 4 , lines 52,53.),

De Jonge et al. does not teach the limitation of a given absolute difference being obtained by subtracting an average pixel value from a given original pixel value (P_t,M_i).

However De Jonge et al. does teach "other statistical parameters of the distribution of differences of pixel-values of successive images, e.g. one may use an average ... (from col. 6, line 64 to col. 7, line 2)."

Auyeung et al. does teach a given absolute difference ("sum of absolute differences (SOAD) (col. 2, lines 14,15)") being obtained by subtracting an average pixel value from a given original pixel value (P_t,M_i) Auyeung et al. states, "the absolute value of the difference between the average pixel value and each pixel value in the current block and then sum the values. This sum is referred to as...(SOAD) (col. 2, lines 12-15).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify De Jonge et al.'s teaching of using an average for differences between pixels with Auyeung's teaching of an average with differences, because Auyeung's teaching prevents "sacrificing video quality" in col. 2, lines 30-32.

12. Claims 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kessen et al. (US Patent 5,055,927 A) in view of De Jonge et al. (US Patent 5,467,380 A).

Kessen et al. teaches a method of encoding (1) an image sequence (V1), comprising the steps of:

a) encoding (Fig. 1, num. 2 and 6 receive images.) a plurality of filtered images (Fig. 1 "HDTV" on the left and right ends are the same) Note that HDTV of fig. 1 is produced from a filter 9 of fig. 1. Therefore, the HDTV on the left end of fig. 1 was filtered by filter 9.

Kessen et al. does not teach the remaining limitations for the filtering steps , but does suggest using a filter for encoding.

De Jonge et al. does teach the remaining limitation of claim 14 in claim 1.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Kessen et al.'s filter with De Jonge et al.'s filter, because De Jonge's filter reduces noise as mentioned in De Jonge et al, col. 3, lines 26,27.

Claim 16 has been addressed in claim 14.

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Rosario-Vasquez whose telephone number is 703-305-5431. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on 703-305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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